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REPORT

INFORMATION FROM

FOREIGN DOCUMENTS OR RADIO BROADCASTS CD NO.

CD NO.

DATE OF INFORMATION 1949

DATE DIST. 29 Jun 1949

NO. OF PAGES 2

SUPPLEMENT TO
REPORT NO.

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SOURCE

Bilten Ministarstva Industrije NR Srbije (Bulletin of Ministry of Industry, Peoples' Republic of Serbia), Vol I, No 1, 1949.

NEW RAW MATERIALS
FOR PRODUCTION OF PAINTS DISCOVERED

Before World War II, the Yugoslav earth color industry imported large quantities of raw ocher from Bavaria, as ocher suitable for oil painting had not yet been found in Yugoslavia. This raw material is in such great demand that about 100 carloads of it could be used every year in Serbia alone. Many foreign countries that lack deposits of good ocher and other raw materials for the production of paint are potential markets for the high-grade earth colors found in Yugoslavia.

Prospecting in certain districts of Serbia has revealed several earth colors which seem at first glance to be suitable for use as raw materials in the production of earth and decorative paints. The following raw materials were discovered during a recent expedition: red earth, No 1, No 2, and No 3; Yellow earth, No 4 and No 5; Gray shale, No 6; Calcareo-siliceous, No 7; and green earth, No 8.

Samples of the earths were examined in the laboratory to determine their technical usefulness for the production of paint. The following results were achieved:

The red earths listed above have been differentiated according to shade and quality. They vary in shade from a bright red with a yellow tint to a red with a dark brown cast. These shades correspond to the red pigments of the oker-majiko (Mexican ocher) type. The structure of all three earths is soapy. They are free from hard particles of quartz and limestone, which would facilitate their further processing into paints. However, earth colors can be separated into pigments with very fine particles by means of ordinary grinding with a blower or wind sifter.

Color No 1 becomes somewhat paler after grinding, but is still a pure red. This is not changed in water, while an oily medium definitely intensifies

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without changing the purity of the red color. Consequently, the pigment obtained from this earth should be used for oil rather than water paints. With the addition of 3 - 5 percent synthetic red iron oxide, this earth color can be used for preparing Pompeian Red.

Red earth No 2 in the form of dust is a very brilliant red, more attractive than No 1, and very satisfactory for water color, while in an oil medium it seems dull and inexpressive. Without any admixture, this earth can be made into English Red for water color.

No 3 is a red with a dark brown cast. Its properties as an ingredient of paint resemble those of No 2, except that it is a little deeper in shade and has a brown cast. No 3 can be used for making decorative pigments to be used for producing fashion brown shades. It is also suitable for tinting.

The yellow earth pigment listed under No 4 is a sandy-limonite ocher. But even from this kind of earth an ocher of brighter and more lively tone can be obtained by ordinary grinding and wind sifting. Attempts to adapt this ocher to the oil process have not produced satisfactory results; however, mixed with a water-color binder, this ocher has proved to be satisfactory for decorating, so that it can be classed as a lime ocher.

Earth color No 5 is an especially pure color with a bright yellow tone, in contrast to earth color No 4. In its powdered state it retains its essential intensity of color. By the grinding and separation of the small particles with a wind sifter, a very fine quality ocher is obtained. By washing this earth color, a paint similar in quality to the French ocher "citron" can be obtained, but its shade in the powdered state is a little brighter than the French ocher. In experiments this ocher has proved to be a very good color for oil, water and tempera technique. For use in lacquer, a little synthetic yellow iron oxide (3 - 5 percent) must be added. Experience has shown that this ocher satisfies all the requirements of an earth color of excellent quality. To the best of our knowledge, this is the finest ocher to be found in Yugoslavia.

Of considerably less importance than the raw materials mentioned above, but nevertheless worthy of mention is the gray shale found under No 6. In structure this shale is hard but brittle, so that it can be ground relatively easily into fine powder. Experiments have shown that this material can be used as a filler in the preparation of surfaces for varnishing.

From one of the samples of No 7 earth examined, it has been established that this material is not chalk, as the natives claim, but white calcareo-siliceous shale. By a further laboratory analysis it has been found that this shale in a finely ground condition fixes basic organic colors very well, preserving the intensity and purity of their color. Accordingly it can be used successfully in the production of wall green, false ultramarine, wine red, and other decorative colors.

The green earth found under No 8 is not actually a color, although it is a somewhat brighter green than the Alpine green earth, but it is an excellent raw material for fixing basic organic colors. Thus, for example, used as a binder for brilliant green in a proportion of 100 : 0.5, it produces a very bright, pure green paint. By using this green earth in an oil vehicle, many shades of unusual brilliance can be obtained, with relatively small quantities of organic pigment. It is particularly well adapted to the making of wall greens (chalky) and wine red (with magenta).

It is of special importance that an examination of the deposits be made by trained geologists and miners to determine their capabilities. Such exploration would be of particular value in Serbia, if it were not limited to the minerals that have already been found.

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